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TITLE: Use of organic spin on materials as a stop-layer for local interconnect, contact and via layers

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Brief Summary Text - BSTX (2):
The present invention generally relates to semiconductor processing, and in particular to use of an organic material as an etch stop layer in a semiconductor process of forming interconnects between semiconductor layers.

Detailed Description Text - DETX (5):
As illustrated in FIG. 2, an organic stop layer 50 is formed over the semiconductor device 30. The organic material used in forming the organic stop layer 50 is suitable for spin techniques and is easily coated onto semiconductor devices. However, any suitable technique (e.g., thermal oxidation, plasma enhanced chemical vapor deposition (CVD), and thermal enhanced CVD) may be employed in forming the organic stop layer 50.
Preferably, the stop layer 50 is Benzocylobuthene (BCB) (having a dielectric constant of about 2.7) or Fluorinated Arylether (FLARE) (having a dielectric constant of about 2.6). BCB and FLARE have low dielectric constant, which enables the organic material to be applied as a relatively thin layer while still mitigating capacitive cross-talk. Low dielectric materials have a reasonably high selectivity to chemistries for etching an

oxide material over
the low dielectric materials, and the selectivity of various embodiments,
respectively, may be tailored to be greater than 5:1. Additionally, the
organic material provides lithographic processes with antireflective coating
(ARC) properties, with no or minimal lithographic performance. An example of
other low dielectric organic materials include Parylene (having a dielectric
constant of about 2.3 to 3.1), Amorphous Teflon (Polytetrafluoroethylene
(having a dielectric constant of about 1.8 to 2.1), Polyimides (having a
dielectric constant of about 3.0) and Silsesquioxanes (having a dielectric
constant of about 2.3 to 3.0).